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Urban Heat Island in the city of Bari (Italy) ant its relationship with morphological features

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The investigation of an Urban Heat Island (UHI) and its relationship with the wide range of factors able to explain its behavior is a very difficult task: the main trouble is represented by the spatial variability of the urban temperature due to the extreme heterogeneousness of the urban coverage and morphological features. In literature it is known that the local surface temperatures are influenced by the changing characteristics in urban surface and modification of land surface processes affecting the surface energy balance and the shape of boundary layer. The whole processes could lead to distinct urban climates.
This work is mainly focused on the mechanisms which are actually connecting the urban morphology with the surface temperature as derived by satellite data provided from the ASTER sensor. Urban morphology could be described by several factors depending on the selected scale of analysis.
At the macroscale the UHI is more related to the land-use, environmental context and boundary conditions. At the microscale the surface characteristics, urban density, ratio between green and built areas and, construction and built typology are more involved in addition to the composite indicators such as the Sky View factor and the elevation of the built texture.
The case study of the city of Bari is faced. It is a medium sized city in the southern Italy, characterized by the presence of a pervasive waterfront and presence of “lame”, a natural erosive furrows shallow that are typical of the Apulia country side. Such ephemeral streams convey the stormwater from the plateau of the hilly Murgia areas to the sea. Moreover, the urban complexity of the city exacerbates the spatial variability of the phenomenon.
The first step aim at the investigating of the relationship between the thermal behavior and the above mentioned factors by the construction of a set of homogeneous morphological units. The classification is built both in the urban and rural zone. The second step focuses on the development of a spatial statistical analysis based on qualitative and quantitative indicators able to link the classes of urban morphology with the satellite-based surface temperature. The relationships highlighted by such a spatial analysis can be used to model the urban climate and, consequently, develop a new kind of planning more addressed towards the mitigation of the UHI phenomenon.